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DIFFERENTIATING THE METRIC [INTERNATIONAL STANDARD]

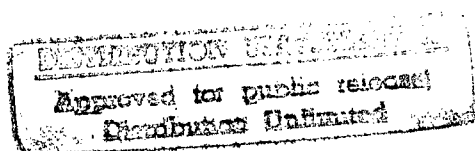
SCREW FROM THE WHITWORTH [THREAD] SCREW

By Li I-hui

- COMMUNIST CHINA -

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## FOREWORD

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DIFFERENTIATING THE METRIC [INTERNATIONAL STANDARD]  
SCREW FROM THE WHITWORTH [THREAD] SCREW

- COMMUNIST CHINA -

[Following is the translation of an article  
written by Li I-hui, in Ta-kung Pao, Peiping,  
5 September 1960, page 3.]

A threaded nail is a screw. It can be inter-changed with another screw and can be taken off easily. It joins parts of a machine together. It is not only widely used in the machine production industry but also very commonly used in tools of our daily life.

China is now promoting the use of international standard screws (threaded bolts). The standards proclaimed by the Government for screws, threaded bolts, and screw nuts and the standards proclaimed by ministries for screw threads are based on the metric system and not the Whitworth system. However, owing to old habits and the need to maintain and repair old machines, screws of the metric and the Whitworth systems are still on sale in markets.

The basic difference between the metric and the

Whitworth screws is in the screw threads. Those that have metric standard threads are called metric screws, while those that have Whitworth standard threads are called Whitworth screws.

According to specifications of government proclaimed standards, metric screw threads are divided into several categories, namely: basic metric screw threads, and the fine metric No. 1, No. 2, No. 3 and No. 4 screw threads. Generally, the screws used for joining parts together are basic metric screw threads. Those used in automobiles and airplanes are mostly fine metric No. 1 screw threads. Screws of fine metric No. 2, No. 3 or No. 4 screw threads are seldom used. The basic cross-section of metric screw threads (including all categories of fine screw threads) is in the shape of an equilateral triangle, with a thread angle of  $60^{\circ}$ ; at the top and bottom of the thread is a small flat surface (the part cut off from the pointed end is equal to  $1/8$  of the height of the original triangle), and the space between the threads is calculated in MM. There is a definite relationship between the thread space and the external diameter of the threads (representing the diameter of the screw or threaded bolt).

Whitworth screw threads are generally referred to as threads made according to British "Wei-shih" [Whitworth]

standards. These threads are divided into rough (common thread) and fine thread. The basic cross-section is an isosceles triangle. The British Whitworth screw threads have a thread angle of  $55^{\circ}$ , at the top and bottom of the thread is a round angle, and the thread space is calculated on the basis of number of threads per inch. In addition, there is a Soviet standard based on the British standard of screw threads, the thread angle and thread space (the number of threads per inch) are similar to the Whitworth screw threads, but the Soviet standard differs from the British in that it has a small flat surface at the top and bottom of the thread instead of a round angle. The diameter of the British screw thread has a definite relationship to the number of threads per inch.

The specifications for metric screws are shown as: diameter (D) x thread space (S) x length (L), and prefix the diameter with an "M". Basic-metric-screw-threaded screws are the most commonly used, but its thread space is generally omitted in the specifications; for instance, diameter D10MM and length L30MM. Semi-roundheaded basic-metric-screw-threaded screws are written as M10x30. If the screws are of the No. 1 fine thread category, it is written as M10x1x30. If it were written as 10x30MM, it would be incorrect, because this does not show whether

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the screws are of the basic thread or the fine thread category, and this is also against the government's unified regulations.

The British specifications for screws are shown as diameter x length. Both are calculated in inches. For instance, a semi-round headed screw  $\frac{1}{4}$ "x1", this means that the diameter of this screw is  $\frac{1}{4}$  of an inch and the length is one inch. Because the most commonly used British screws are of the rough thread type, there is no need to specify it. But, if fine thread screws are to be used, then "fine thread" must be added after the specification of length. For instance,  $\frac{1}{4}$ "x1", fine thread. Some people write length first and diameter last as: 1"x $\frac{1}{4}$ ". This is incorrect.

According to government regulations, all screws and threaded bolts must be made according to metric standards. In making designs for new products, metric screws must be used. British-made screws are used only for the maintenance and repair of old machines. In their desire to promote the use of metric screws, some people have written the diameter and length of British made screws (threaded bolts) in MM, such as changing 5/16 inch x 1 inch British made screw into "8x25MM". This is a mistake.

In actual inspection and application, how can metric screws (threaded bolts) and British-made screws (threaded

bolts) be differentiated? The simplest method is:

(1) to use the screw thread indicator to decide the difference:

The screw thread indicator (see figure below) is also called the thread space indicator or thread angle indicator. It is made of a type of thin steel plate. It comes in a set and is the most simple tool to distinguish screw threads. On each indicator, the exact metric screw thread measurement is engraved and the corresponding number of threads of the British standard. When the indicator is set on the screw to be tested and if it fits exactly onto the threads of the screw, this will indicate whether the screw is of the metric or British standard.

(2) to use a threaded ring or screw nut to decide the difference:

The external appearance of a threaded ring is like a round screw nut. There are two types, one that can be screwed through the other end of the screw, which is known as the "through end threaded ring", while the other type is one that cannot be screwed through the other end of the screw, and is known as the "not through end threaded ring". A standardized measurement is engraved on the surface. If the ring is put on a screw that has a similar diameter, and if the ring can be screwed on the threads

freely. It will indicate whether the screw is of the metric or British standard.



Screw Thread Indicator

10,010

- END -